Rapid Soil Stabilization Technologies

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2004 Demonstration Project

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Rapid Soil Stabilization

Purpose

- To employ mats, soil stabilizers, fibers, geotextiles, etc… for rapidly constructing airfield facilities
  - *Low Logistical Effort*
  - *Low-Dosage Stabilization*
  - *Reduced Cure/Construction Tim*
  - *Tailored to Mission Requiremen*
  - *roofing/Dust Control*

ERDC HVS Test Facility
C-130 Wheel, 30,000 Lbs
On Stabilized Soil

Soil Stabilization

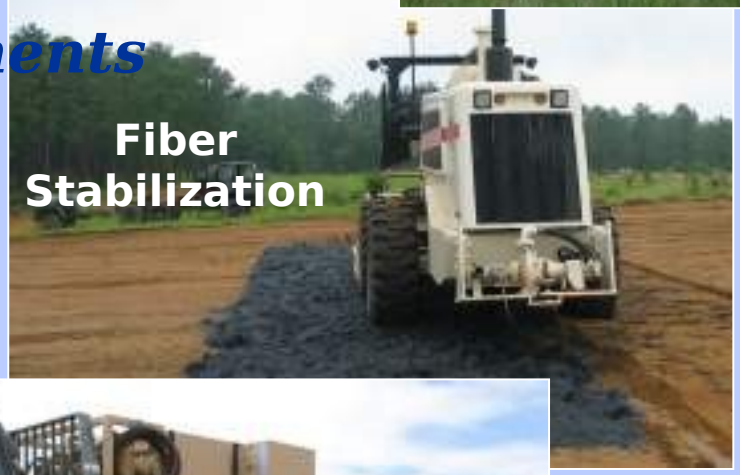
Mat Placement

Dust Control

Rapid Soil Stabilization

Progress:

- Tested Commercial Mat Typ
  Over Different Soil Strengt
- Developed Rapid Soil Stabi
  - *Fibers and Fast-Setting Cements*
  - *Polymers and Fast-Setting Cements*
- Improved Dust Abatement
  - *Topical Applications*
    Sharply Reduce Airborne Dust
  - *HUMVEE Sprayer*
- Developed Cold Weather Stab
  - *Admixtures in Cement For*
    Curing under Freeze-Thaw Co



JRAC Demo

Mat Technologies

- Mats are Reusable, Readi
  Assembled and Replaceal
- Mats Reduce Soil Deform
  Under Heavy Aircraft Loa

Ft. Bragg Demo – Apron 1

Liquid Polymer and Cement / Polymer Cap Combo

- 3% Polymer + 3% Cement – Tested to 750 C-130 Passes
- Increased CBR from 10-15 to 100+

Cement Spotting and Spreading

MTVR/Terex

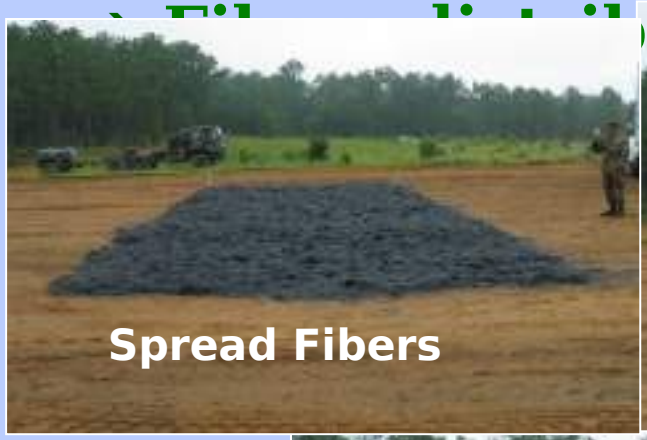
Compaction

Polymer/Cement Mixing

Ft. Bragg Demo – Apron 2

Fiber and Cement / Polymer Cap Combo

- 0.4% Fibers/4% Cement – Tested to 750 C-130 Passes
- Increased CBR from 10-15 to 80+
- Fibers distribute load over broad area


Spread Fibers

Mixing

Mixed Fibers

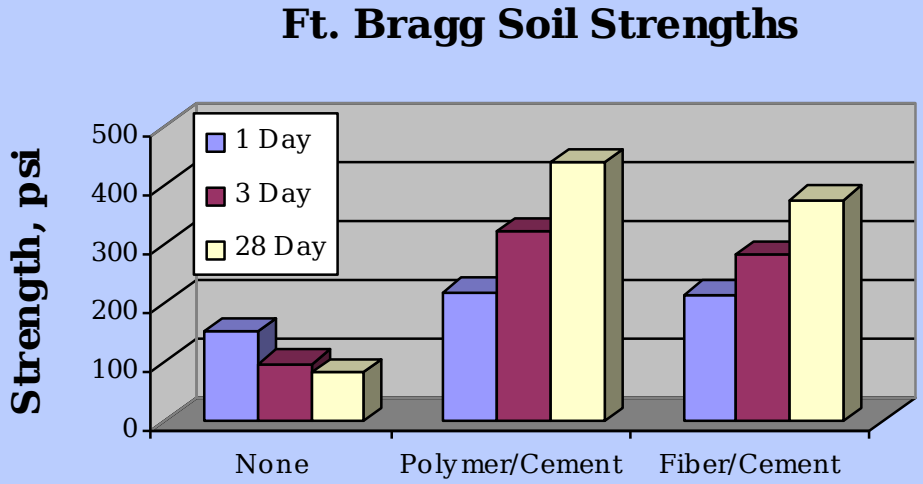
Cement Spotting and Spreading

Fiber/Cement Compaction

Ft. Bragg Demo

Why Polymers and Fibers?

- **Reduced Logistics**
  - *Polymers and Fibers Weigh 1/3 Less Than Cement*
- **Improved Performance**
  - *Less Cracking Means Less FOD*
- **Polymer and Cement Synergy**
  - *Polymer Helps Cement*
  - *Cement Helps Polymer*



Ft. Bragg Demo

Weatherproofing and Dust Control

- **Liquid Polymer Emulsions**
  - ***Forms Tough Weatherproof Layer on Soil Surface That Locks Down Dust***
- **Synthetic Oils**
  - ***Resists Water***
  - ***Glues Dust Particles Together Preventing them from Becoming***

Rapid Soil Stabilization

- **Products**
  - **C-130 Deliverable Soil Stabilization Equipment**
    - *Terex RS-325 Reclaimer/Stabilizer*
    - *Liquid Mixing and Dispensing Cap*
  - **Lower Logistics and Improved Per for Mission-Specific Soil Stabilizat**
    - *24-Hour Stabilization*
    - *Reduced Cracking and FOD P*

Rapid Soil Stabilization

- **Products**
  - **Improved Airfield Matting Syst**
  - **Rapid Dust Control Equipment and Materials**
  - **Freeze-Thaw Stabilization Tech**